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The attached documents are exact copies of the European patent application described on the following page, as originally filed.

Les documents fixés à cette attestation sont conformes à la version initialement déposée de la demande de brevet européen spécifiée à la page suivante.

Patentanmeldung Nr. Patent application No. Demande de brevet n°

02292344.5

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Bezeichnung der Erfindung/Title of the invention/Titre de l'invention:
(Falls die Bezeichnung der Erfindung nicht angegeben ist, siehe Beschreibung.
If no title is shown please refer to the description.
Si aucun titre n'est indiqué se référer à la description.)

Hybrid Card

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Hybrid card

The present invention concerns hybrid cards, which are graphically personalized on their surface by means of dye thermal transfer printers. "Hybrid cards" stand here, in particular, for cards including a 1st chip with its ISO 7816 contact interface and a second chip with its ISO 14443 contactless interface.

As illustrated in figure 1 . conventional hybrid cards constructions are based on:

- A contactless chip (1) connected to an antenna (2), either directly by means of the flip-chip technology, either indirectly if it is encapsulated into a module that is connected to the antenna by means of either welding, brazing or conductive adhesive based technologies. The antenna is a set of loops that may be either constituted of winded wires, either printed by way of additive or subtractive processes. The antenna and the contactless chip or contactless module are embedded in the card body (3)
- A contact chip connected to contact areas located as defined in the ISO 7816 standard. This chip is most generally encapsulated in a module (4).

Conventional hybrid card manufacturing technologies do not comply with dye thermal transfer printing process due to the surface unevenness defect induced by the contactless chip or contactless module located in the thickness of the card body.

As a matter of fact, the difference between the coefficients of thermal expansion of the chip or the module and the plastic materials composing the card body originates a local non-homogeneity of the shrinkage that appears during the cooling step of the lamination process.

As shown in figure 2, this non-homogeneity is itself responsible for a local unevenness defect (5) at the surface of the card.

This surface defect causes a fading of the dye transfer printed colors.

This problem is solved by way of the following concept:

- The contactless chip is encapsulated in the same module as the contact chip and is therefore not any more placed within the thickness of the card body.
- This module is connected to the antenna, thus ensuring the electrical link between the contactless chip and the antenna.

Figure 3 shows a practical example of the concept explained hereinbefore:

- The contact chip (6) is connected to the ISO 7816 contact areas of the module by means of bonded wires.
- The contactless chip (7) is stacked upon the contact chip (6) and is connected to the conductive tracks (8) at the backside of the module by means of bonded wires.
- The conductive tracks (8) are connected to the antenna contact areas (10) by means of conductive adhesive filled holes (10).

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Claim

1. Smart card wherein the smart card comprises a chip.

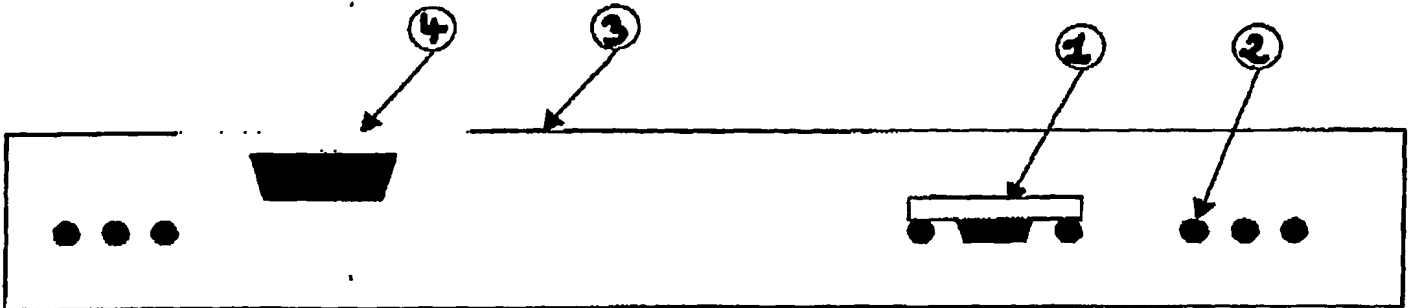


Figure 1

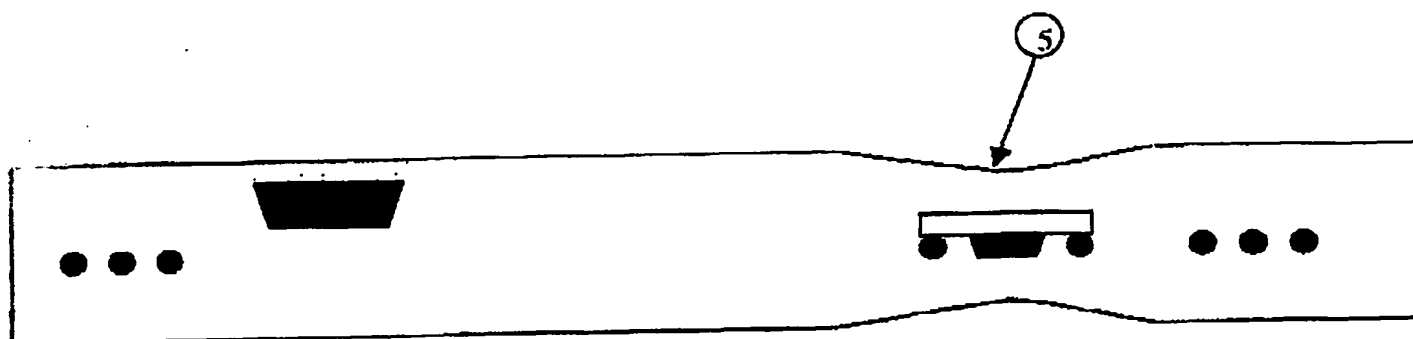


Figure 2

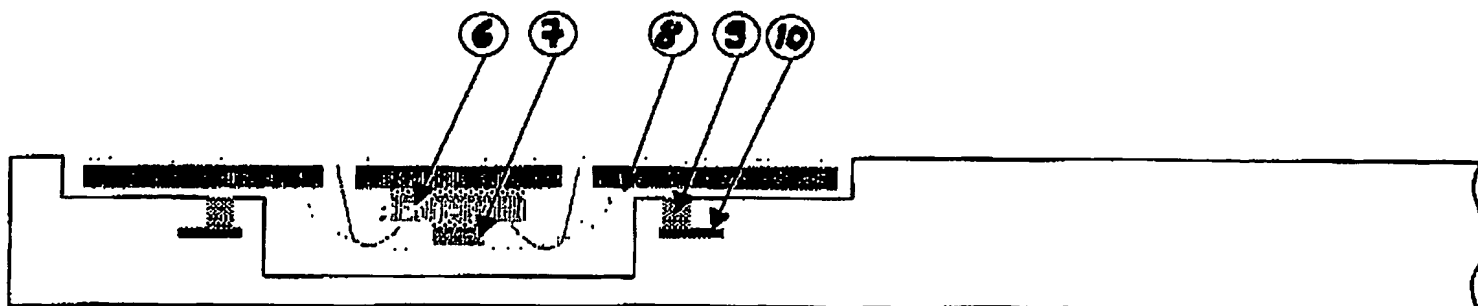


Figure 3